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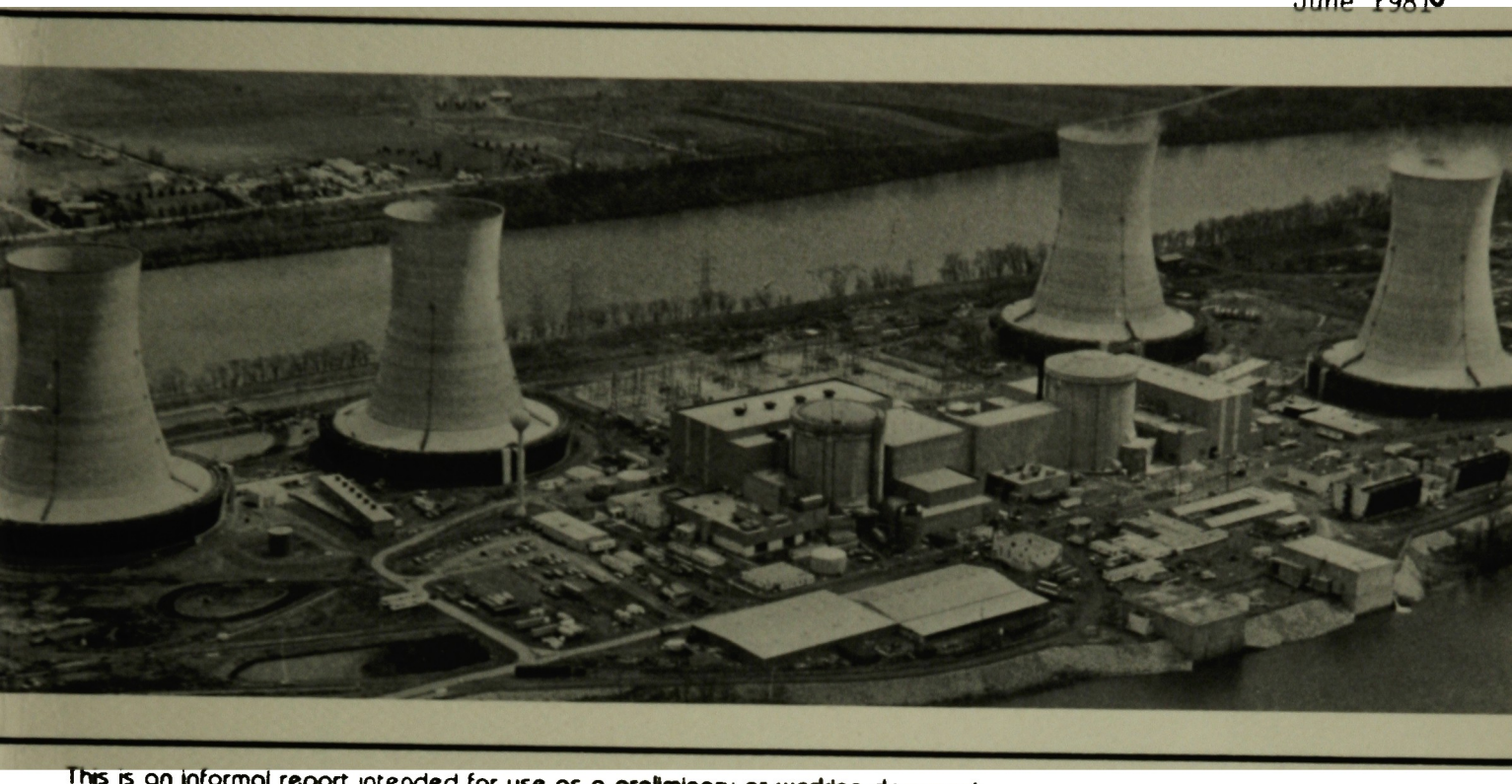



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# QUICK LOOK REPORT

## ENTRY 1

## THREE MILE ISLAND UNIT 2

July 23, 1980

Bechtel Northern Corporation/
General Public Utilities Nuclear Corporation



Prepared for the
U.S. Department of Energy
Three Mile Island Operations Office
Under Contract No. DE-AC07-76ID01570

## DISCLAIMER

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Edited and Published June 1981

by

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Idaho Falls, Idaho 83415

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ABSTRACT

This report summarizes tasks performed during the initial entry at Three Mile Island Unit 2. During the entry into containment, which was made on July 23, 1980, 29 pictures were taken, six 100-cm swipes were taken, and a general area beta and gamma survey was conducted to acquire data on Elevation 305. The first entry team spent approximately 20 minutes inside the containment building.

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ENTRY 1

THREE MILE ISLAND UNIT 2

July 23, 1980

## SUMMARY OF ENTRY

During the initial entry into Unit 2 Reactor Building on July 23, 1980, 29 pictures and six 100-cm swipes were taken, and a general area beta and gamma survey was performed. In addition, a 5-gallon plastic bucket was removed from the building for analysis.

The general area gamma readings on Elevation 305 were in the range of 400 to 600 mrem/hour near the airlock where entry was made into the building. The gamma readings increased to 700 mrem/hour in the area near the other airlock at the equipment hatch. The gamma readings were 8 rem/hour in the enclosed stairwell, 10 rem/hour over the metal deck for the covered floor hatch, 4 rem/hour at the edge of the metal covered floor hatch, 1.4 rem/hour at the air coolers, and 18 rem/hour over the top stairwell. The gamma readings against the D-ring and liner were approximately 400 mrem/hour, while the floor drains ranged from 2 to 5 rem/hour. The core flood piping, seal injection piping, and elevator door all read 3 rem/hour on contact. See Figure 1 and Table 1 for details.

The general area floor and wall beta readings ranged from 1 to 2 rad/hour.

The whole body exposure to the personnel for the 20 minutes in the building was approximately 190 mrem, with the maximum extremity of approximately 220 mrem. There was no beta skin exposure measured.

The photographic survey showed no significant structural damage, and only the door to the stairwell showed visible damage. There were deposits of rust and dirt on the floor with obvious water marks, most likely from the operation of the building spray system.

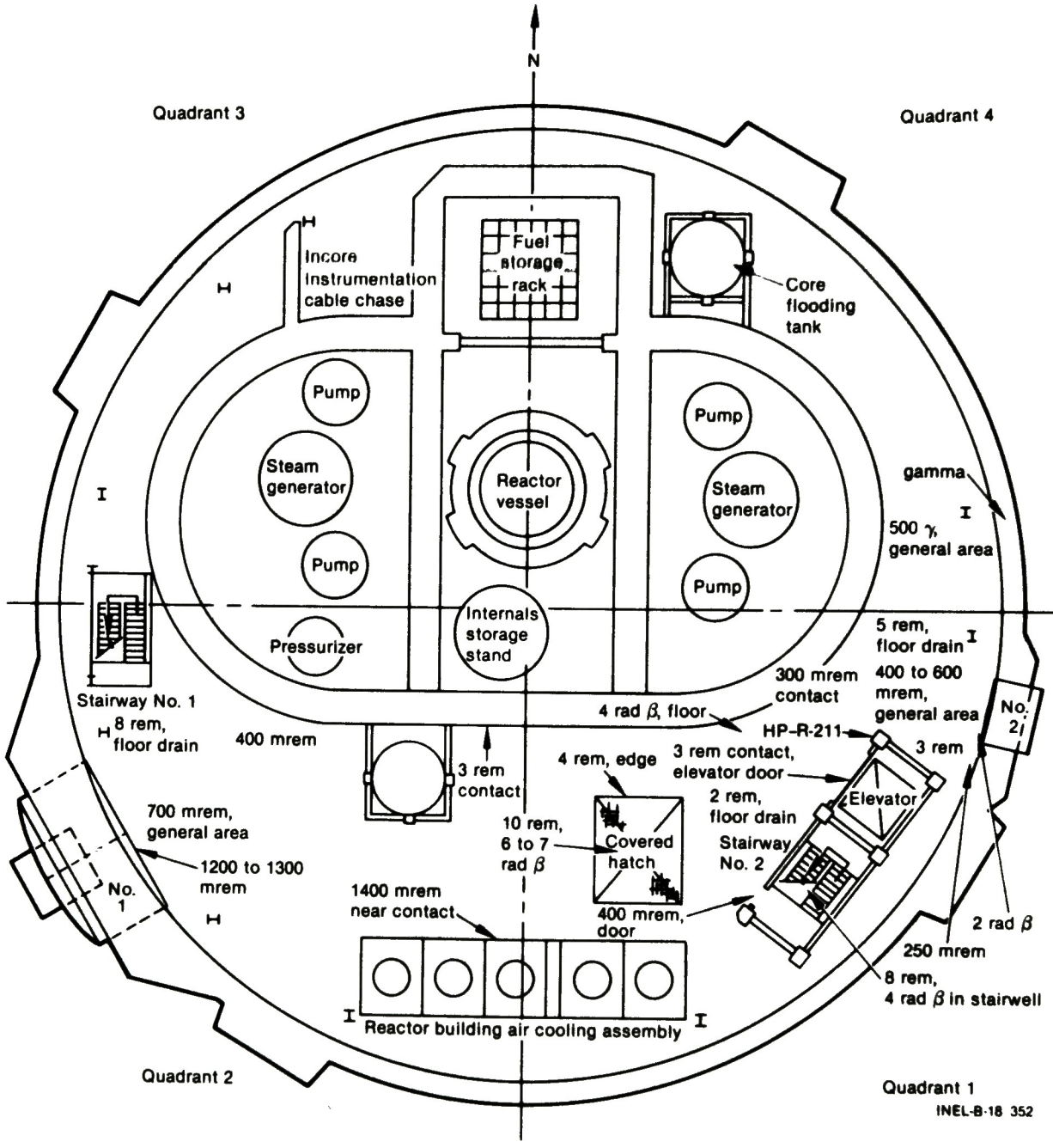


Figure 1. Elevation 305, entry 1 radiation readings.

TABLE 1. PRELIMINARY ANALYSIS RESULTS OF SWIPES TAKEN DURING INITAL ENTRY OF CONTAINMENT BUILDING, JULY 23, 1980

| Swipe Number | Sample Number | Swipe Location | Activity Detected (μCi) | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Co-60 | Nb-95 | Sb-125 | Cu-134 | Cu-137 | Ce-144 | Gross β-γ | Gross α | |
| 1 | 46279 | Reactor building liner next to south wall of airlock | | 1 | | $3.91^{-4}$ | $2.25^{-3}$ | | $2.54^{-3}$ | $<1.75^{-7}$ | |
| 2 | 46280 | Painted portion of north wall of elevator shaft | | | | $1.51^{-3}$ | $9.81^{-3}$ | | $6.59^{-3}$ | $<2.76^{-7}$ | |
| 3 | 46281 | Reactor building floor at the base of the entrance ramp | | $1.97^{-3}$ | | $5.78^{-1}$ | $3.48^{10}$ | | | | |
| 4 | 46282 | D-Ring wall opposite entrance ramp | | $1.56^{-5}$ | | $8.33^{-4}$ | $4.70^{-3}$ | | $4.78^{-3}$ | $<1.75^{-7}$ | |
| 5 | 46283 | Reactor building floor between equipment hatch and stairwell | | | | $1.98^{10}$ | $1.20^{1}$ | | | | Swipe may have been cross-contaminated in airlock |
| 6 | 46284 | D-Ring adjacent to open stairwell | $1.92^{-5}$ | | $3.29^{-4}$ | $2.31^{-3}$ | $1.60^{-2}$ | $1.81^{-4}$ | $1.43^{-2}$ | $<2.76^{-7}$ | Swipe may have been cross-contaminated in airlock |
| 7 | 46285 | No swipe taken--swipe contaminated in airlock | | | | $4.70^{-4}$ | $3.12^{-3}$ | | $2.58^{-3}$ | $<2.76^{-7}$ | |
| 8 | 46286 | No swipe taken--swipe contaminated in airlock | | | | $6.41^{-5}$ | $3.93^{-4}$ | | $1.59^{-4}$ | $<2.76^{-7}$ | |
| 9 | 46287 | No swipe taken--swipe contaminated in airlock | | | | $3.22^{-3}$ | $2.03^{-3}$ | | $1.58^{-2}$ | $<2.76^{-7}$ | |
| 10 | 46288 | Sample recovered from 16 July 1980 inner door opening | | | | $4.12^{10}$ | $2.50^{1}$ | | | | |

The floor swipes indicated the concentrations of activity of Cs-134 and Cs-137 ranging from $3 \times 10^{-2}$ to $1 \times 10^{-1}$ $\mu Ci/cm^2$. Lesser levels of Cs-134 and Cs-137 ranging from $2 \times 10^{-5}$ to $4 \times 10^{-4}$ $\mu Ci/cm^2$ were found on the walls.

Cerium, cobalt, antimony, and niobium were found on the vertical wall swipes in concentration of $1 \times 10^{-7}$ to $1 \times 10^{-6}$. These isotopes were also most likely present in the floor swipes, but were not detectable due to the levels of the cesium present.

ENTRY 1 TRANSCRIPT

Benson to Base: I'm ready to turn the handwheel, over.

Base to Benson: Roger, out.

Benson to Base: The airlock is equalizing over--now--over.

Benson to Base: Benson to Base--still equalizing, over.

Base to Benson: Roger, out.

Behrle to Benson: I'm ready Michael, over.

Base to Behrle: Are you commencing to open the door now? over.

Behrle to Base: The inner airlock door is opening, over.

Base to Behrle: Roger, you're on the clock, over.

Behrle to Base: I read 400 millirem about 6 feet inside the building, head height, over.

Base to Behrle: Roger, out.

Behrle to Base: I have entered the building, over.

Base to Behrle: Roger, out.

Behrle to Base: A swipe area reads 250 millirem gamma.

Base to Behrle: This is Base--we did not copy, over.

Behrle to Base: A swipe area reads 250 millirem; B swipe area, swipe reads 2 rem.

Base to Behrle: Roger, we copy.

Benson to Base: I have taken the A and B swipes; the readings are 1 rad, over.

Behrle to Base: The red area reads between 400 and 600 millirem, that is shoulder height to floor, on contact with floor they all read about the same, over.

Base to Behrle: Roger, we copy.

Benson to Base: Do you copy? Over.

Base to Benson: We copied the last transmission, over.

Benson to Base: I have taken the A, B, and C swipes; I am taking D, over.

Base to Benson: Base did not catch the last end, repeat please, over.

Behrle to Base: The floor drain on contact next to the ramp reads about 5 rem on contact, over.

Benson to Base: Do you read me? Over.

Base to Benson: Roger, we copied.

Benson to Base: I have taken all 4 swipes, over.

Base to Benson: Roger, we copy; you took all 4 swipes, over.

Benson to Base: The surface readings for all the swipes are 1 to 2 rads, over.

Base to Benson: Roger, 1 or 2 rads, over.

Benson to Base: The general area still reads 0 rads (words?), over.

Base to Benson: We need a digital on you and Behrle, Benson first, over.

Behrle to Base: My digital reads 23 millirem, over.

Base to Benson: We did not get a transmission out of you. Could you give us your dosimeter, over.

Benson to Base: 19 millirem, over.

Benson to Base: (Word?) That's 19 millirem, over.

Base to Benson: Roger 18 millirem, over.

Behrle to Base: The high pressure injection line above the D-ring reads about 3 rem on contact.

Base to Behrle: Roger, we copy the 5 rem, we don't know the area, over.

Behrle to Base: The D-ring reads about 300 millirem on contact at 5 or 6 different locations, over.

Base to Behrle: Roger, that's the yellow area. By the way, you are 5 minutes, 35 seconds into entry, over.

Behrle to Base: It's the red to yellow area, over.

Base to Behrle: Did not copy, over.

Base to Benson: Base to Benson, Base to Benson--do you have any beta readings? Over.

Benson to Base: At the edge of the red area on contact with the floor I am reading 4 rad, over.

Base to Benson: Roger, we copy. Four rads--edge of the red.

Benson to Base: In the general vicinity, in the area its 1 rad, over.

Behrle to Base: The general area radiation levels in orange are about 500 millirem, over.

Base to Behrle: Roger, we copy. You are now 7 minutes, 21 seconds into entry, please come back with your dosimeter readings, over.

Behrle to Base: My dosimeter reading is 43 millirem, over.

Base to Behrle: Roger.

Behrle to Base: Benson's air pressure reading is 1800 pounds, over.

Benson to Base: I read 40 millirem, over.

Base to Benson: Roger, we copy.

Behrle to Base: The elevator door reads 3 rem on contact, over.

Base to Behrle: Roger, we copy.

Base to Behrle: Was that the elevator door? Over.

Behrle to Base: The floor drain in yellow--reads 2 rem, over.

Behrle to Base: The stairwell door has been blown open by the explosion, over.

Base to Behrle: Base did not copy, over.

Behrle to Base: The stairwell door by the elevator has been blown (word?) open by the explosion. It reads 400 millirem, over.

Base to Behrle: Roger, we copy, over.

Base to Benson: Are you getting pictures? Over.

Behrle to Base: The radiation reading in the stairwell is 8 rem, 8 rem, over.

Base to Behrle: Roger, we copy, 8 rem in the stairwell. Are you getting pictures? Over.

Benson to Base: I have taken several pictures. The reading in the stairwell is 4 rads, over.

Base to Benson: Roger, we copy, 4 rads in the stairwell, over.

Base to Benson and Behrle: You are now 10 minutes, 22 seconds into entry. We need your dosimeter readings, over.

Behrle to Base: My dosimeter reads 73, 73 millirem, over.

Base to Behrle: Roger, 43 millirem, over.

Benson to Base: (Interruption by Behrle) 73 millirem, over.

Base to Behrle: We had dual transmission. Was that 83 millirem, Behrle? Over.

Behrle to Base: Affirmative, over.

Benson to Base: I have 60 millirem, over.

Base to Benson: Roger, we copy--60 millirem, over.

Osdon to Base: I have completed wiping down the inner reactor door and seal area.

Base to Osdon: We could not understand the last transmission and we don't know who it came from, over.

Osdon to Base: I have completed wiping down the inner reactor door and seal area.

Base to Osdon: Roger, we copy.

Behrle to Base: The highest reading over the hatch, over the hatch is 10 rem, over.

Base to Behrle: Roger, 10 rem, over.

Benson to Base: The beta reading over the hatch is 6 to 7 rad, over.

Base to Benson: Roger, we copy--67 rads.

Behrle to Base: At the edge of the hatch it is 4 rem, over.

Base to Behrle: Base could not copy, try again, over.

Benson to Base: The beta reading over the hatch is about 7 rad, over, over.

Base to Benson: Roger, we copy.

Behrle to Base: The flood pipe reads 3 rem on contact, over.

Base to Behrle: Roger, we copy. You are now 13 minutes, 10 seconds into entry. We would like a dosimeter reading, over.

Behrle to Base: 108 millirem, over.

Base to Behrle: Roger, we copy.

Base to Benson: We need a digital dosimeter on you, over.

Benson to Base: 116 millirem, over.

Base to Benson: Roger, we copy. 115, over.

Behrle to Base: It is 1400 millirem at air cooler.

Base to Behrle: We did not copy, please repeat.

Behrle to Base: Air cooler.

Base to Behrle: We copy, 115 millirads, I mean millirem beta.

Behrle to Base: General background radiation readings in blue is 700 millirem, over.

Base to Behrle: Roger, we copy, over.

Behrle to Base: Behrle to Base--ramp? On contact is reading 1200 millirem?

Base to Behrle: Roger, we copy.

Base to Benson and Behrle: You are now 16 minutes, 3 seconds into entry, please give us your dosimeter readings.

Behrle to Base: The D-ring on contact reads 400 millirem, over.

Base to Behrle: Roger.

Behrle to Base: My digital dosimeter reads 135 millirem, over.

Base to Behrle: Roger, we copy.

Base to Benson: We need your dosimeter reading, over.

Behrle to Base: The floor drain in blue reads 8 rem, over.

Base to Behrle and Benson: Roger--Benson, we need your dosimeter, over.

Benson to Base: 143 millirem, over.

Base to Benson: Roger, Benson, we copy; 143 millirem.

Base to Benson and Behrle: Start procedure to exit the building, over.

Behrle to Base: Affirmative, over.

Base to Behrle: Roger, We copy your acknowledgement, over.

Benson to Behrle: Don't forget the light, over.

Base to Benson and Behrle: Base did not copy, come back, over.

Benson to Behrle: Bill, don't go around behind the core flood tank.

Base to Benson and Behrle: You are now 18 minutes, 45 seconds into entry, over.

Base to Benson and Behrle: Please notify us when you get to the airlock, over.

Base to Benson and Behrle: Please give us your location, over.

Base to Osdon: Base to Darryl, Base to Darryl--where is the entry team? Over.

Osdon to Base: Benson and Behrle on (word?) for the airlock commencing to shut the outer door.

Base to Osdon: Roger, we copy, you're getting ready to shut the outer door. Is that affirmative? Over.

Benson to Base: My dosimeter reading is 172 millirem, over.

Base to Behrle: What is your dosimeter reading? Over.

Base to Behrle: Base to Behrle, Base to Behrle--what is your dosimeter reading? Over.

Behrle to Base: 176.

Base to Behrle: Roger, we copy, 176.

Benson to Base: My digital dosimeter on my left arm is 175 and the right arm dosimeter reads 216, over.

Base to Behrle: Base to Behrle--keep it in your head, we can't copy all the information, over.